

clearer than this. In fact it is in the plant world that we must look for much of our testimony along the more difficult lines of biological science. And it is the duty of botanists to clear up the confusion of their terminology, especially along those lines which are subject to so great popular misapprehension. It should not be possible, even for the casual reader of botany, to encounter such contradiction and error as clusters about the spermaphytic plants, imbedded in a misleading terminology.—CONWAY MACMILLAN, *University of Minnesota, Minneapolis.*

NOTES AND NEWS.

THE VENERABLE curator of the botanical museum at Berlin, Friedrich Karl Dietrich, is dead at the age of 85.

DURING THE year 1890 42,646 specimens were added to the Herbarium of the British Museum, according to the report just published.

MR. A. S. HITCHCOCK, of the Missouri Botanical Garden, has been appointed Professor of Botany in the Agricultural College of Kansas at Manhattan.

MR. P. H. ROLFS, recently connected with the Iowa Agricultural College, at Ames, has been appointed botanist and entomologist of the Florida Agricultural Experiment Station at Lake City, Fla.

MR. WILLIAM WEST has a paper in the December number of the *Journal of Botany* on the freshwater Algae of Maine, in which three new species and several new varieties are described. There are also notes on other species of the collection.

DR. FR. ORTLOFF of Coburg (Thuringia) Germany, has just issued a series of photographic reproductions of the stem-leaves of *Sphagnum* which are of so much diagnostic importance in the discrimination of the polymorphic species of this genus. The series contains 63 plates.

PROF. L. H. BAILEY has been appointed special agent of the United States Weather Bureau to make a report upon phenology, and desires reference to all records upon the relation of climate to the times of blooming, fruiting, leafing, etc., of plants. He may be addressed at Ithaca, N. Y.

PROF. R. E. CALL has given an account of the silicified woods of E. Arkansas in the *American Journal of Science* (Nov. 1891), in which he concludes that they are all Tertiary (Eocene), are silicified lignite, and are as yet of no taxonomic value in determining relative ages in the Tertiary series.

THE MOSS herbarium of the late Dr. S. O. Lindberg has been acquired by the University of Helsingfors. Exclusive of duplicates and of numerous exsiccati the collection contains 5,046 species represented

by 47,858 specimens. It is especially rich in northern Hepaticæ, and is remarkable for the completeness, abundance and critical elaboration of the material.

PROF. W. W. BAILEY writes: "One of my students called my attention the other day to a *Linaria* raceme in which the flowers were all spurless. *Peloria* is not infrequent this autumn." And again: "As my colleague, Mr. Bennett, was drying some capsules of *Ceanothus* in the sun, for the purpose of securing the seeds, he noticed, and showed me, that these parts exploded with much violence, ejecting the seeds."

A FOUR PAGE supplement to the "Analytic Keys to the genera and species of North American mosses" has been prepared and issued as separates from the 8th volume of the Transactions of the Wisconsin Academy. It contains additions and corrections and may be obtained of the author (C. R. Barnes, 712 Langdon St., Madison, Wis.) *gratis*, by sending a request accompanied by a 2-cent stamp. It will be of no value except to those who have a copy of the Keys.

THE SERIES of *Hepaticæ Americanae exsiccatae* has been issued by L. M. Underwood and O. F. Cook, in sets of two decades annually since 1887. Many rare and previously undistributed species have been sent out, and others are to follow, including specimens from British Columbia, Florida, Cuba and Mexico. Decades XI and XII are now ready for distribution. Preceding issues are all exhausted with the exception of decades IX and X, of which a few sets are still on hand. Correspondents should now address Dr. Underwood at Greencastle, Ind.

IN VIEW OF a contemplated special investigation of the genus *Astragalus* (including *Phaca*, *Diplothea*, *Homalobus*, and *Podolotus*), Mr. E. P. Sheldon, Assistant in Botany at the University of Minnesota in Minneapolis, desires specimens of this genus from all parts of the world. In exchange he offers either fungi or flowering plants from the valley of the Minnesota river, which derives a peculiar interest from its position as the central drainage system of the continent of North America. Plants may be sent to him in care of the university, and will be promptly acknowledged.

THE HERBARIUM of Indiana University was established upon the election last April, of Professor John M. Coulter, as President. In addition to private material already in the possession of Professor Coulter, a liberal appropriation for the purchase of plants was made. All the well-known collectors of phanerogams and pteridophytes were asked to furnish as complete sets of their collections as possible, and these purchases now amount to over 15,000 species of North American plants. A very valuable library of reference books has also been secured. It is expected that the collection of books and plants will increase as rapidly as material for purchase or exchange becomes accessible. Mr. Henry E. Seaton has been appointed curator.

A NEW JOURNAL of forestry, *Forstlich-naturwissenschaftliche Zeitschrift*, is to be begun with the year. It is to be the organ for the Munich laboratories of forest botany, zoology, chemistry and meteorology, under the editorial management of Privat-docent Dr. Carl von Tubeuf of the University of Munich. Of course it has the support

and contributions of Dr. R. Hartig who is to continue in this journal the "Untersuchungen aus dem forstbotanischen Institut" he ceased to publish in 1883. Drs. Ebermayer, Pauly and Baumann of Munich are to aid, and the journal has the promise of coöperation from many others who are learned in forestry. Among these we notice but one from this country, Mr. B. E. Fernow, chief of the division of forestry of the Agricultural Department.

DR. PAUL KNUTH seeks to explain why many flowers, without apparently very attractive coloration are so readily found by insects. *Sicyos angulata*, for example, was surrounded by swarms of insects, while at the same time other plants in the botanic garden at Kiel were neglected. The ethereal oil secreted by the glands of the flowers, stem and leaves, which affect the senses of man so slightly, may be partly the cause of the attractiveness of this plant to its insect visitors. But he finds also that the greenish white flowers are probably much more striking to insect eyes than to our own, on account of the ultra-violet rays which lie beyond the range of our vision. That such rays are reflected by these flowers he showed by their effectiveness upon photographic plates with short exposures. They are photographically as active as white flowers, while the intensity of light reflected (photometric activity) is only one-third that of white flowers. We have here apparently an analogy with those sounds which can be heard by insects, but which are beyond the range of the human ear.

MR. JOHN B. LEIBERG writes from northern Idaho: "My list of mosses from this region now foots up 304 species and varieties. Many of these are as yet undetermined. Some have only turned up as fragments amongst other mosses. . . . The magnitude of western bryology is utterly unappreciated by bryologists of this country unless they have been here in person and seen it with their own eyes. Most of my observations have been limited to the western slope of the Bitterroot mountains. There are 250 miles of this range extending north and south, and the width of the western slope varies from 30 to 120 miles. There are millions of canyons and ravines in this tract of country. Of all the thousands I have seen into I never saw two where exactly the same climatic conditions prevailed. It is a fact easily proved that changes on climatic conditions mean changes in both the vegetative and structural aspect of mosses more quickly than in any other group of plants. . . . It is an impossibility for collectors to obtain all the various aspects of any species for generations to come, so our knowledge of the western mosses will come slowly and painfully, for collecting mosses among these mountains is no holiday excursion."

DR. FR. KRASSER recommends the following methods for preparation of permanent mounts of aleurone grains to show the ground substance, crystalloid and globoid differentially stained.

I. Picro-eosin method. Fix the section with picric acid dissolved in absolute alcohol; remove the excess by washing with absolute or a high grade alcohol; stain with eosin dissolved in absolute alcohol; partially decolorize with absolute alcohol; clear with clove oil; mount in Canada balsam dissolved in chloroform. The course of the stain-

ing, which is completed in a few minutes, should be watched under the microscope, as should also the toning down. The most successful preparations show the ground-substance dark red, the crystalloid yellow with sharp contours, and the globoid nearly colorless to reddish.

II. Picro-nigrosin method. Place the section in alcoholic-picro-nigrosin (a saturated solution of picric acid in absolute alcohol+nigrosin approximately to saturation) in which it is allowed to remain until the ground-substance of the aleurone grain shows a blue coloration. This is to be determined by observations at intervals with the microscope, the specimens being put into absolute alcohol temporarily. Wash with absolute alcohol; clear on the slide with clove oil; mount in Canada balsam, removing the clove oil with filter paper. The most successful preparations show the ground substance blue, the globoid colorless, and the crystalloid yellowish green and sharply limited.

THE difficulty of keeping Irish potatoes in edible condition in late spring is well known to housekeepers, farmers, and merchants. Professor Schribaux of the National College of Agriculture of France has recently devised a very simple, cheap, and successful method by which he has been able to preserve potatoes in edible condition for over a year and a half. This process has been adopted by the French government for preserving potatoes for the army. The French Minister of Agriculture publishes the details of the process in the official *Bulletin du Ministère de l'Agriculture* for March, 1891. The following is a translation of the essential part of the scheme. The method of preservation consists in plunging the tubers, before storing them away, for ten hours into a two per cent. solution of commercial sulphuric acid in water, two parts of acid to 100 parts of water. The acid penetrates the eyes to the depth of about one-fortieth of an inch, which serves to destroy their sprouting power; it does not have any appreciable effect upon the skin of the potatoes. After remaining in the liquid ten hours the tubers must be thoroughly dried before storing away. The same liquid may be used any number of times with equally good results. A barrel or tank of any kind will do for the treatment. The acid is so dilute it does not affect the wood. Chemical analysis shows that potatoes treated by this process are as nutritious and healthful after eighteen months as when freshly dug; but they are of course worthless for planting. Attention is called to this method by Gerald McCarthy, N. C. Experiment Station, Raleigh.—*Science*, Nov. 13.

IN THE *Revue Bryologique* (n. 6, 1891) appears a synoptic table of the species of the genus *Fontinalis* recognized by M. Jules Cardot in his recent revision of the family Fontinalesæ. which he hopes to publish early this year. The North American species are as follows according to M. Cardot :

§ I. Tropicophyllæ.

- F. antipyretica L. (N. Am.)
 - var. gigantea Sull. (N. Am.)
 - var. Californica Lesq.—(Calif.)
 - var. Oregonensis R. & C.—(Oregon.)
 - var. rigens R. & C.—(Vancouver: Wash.)
 - var. ambigua Card.—(Oregon.)

- **F. Kindbergii* R. & C.—(Vancouver: Oregon: Idaho.)
 **F. Neo-Mexicana* S. & L.—(Rocky Mts.: N. M.: Idaho: Calif.: Wash.: Vancouver.)
 **F. Columbica* Card.—(Br. Columbia.)
F. chrysophylla Card.—(Utah.)

§ II. Heterophyllæ.

- F. Howellii* R. & C.—(Oregon.)
F. biformis Sull.—(Ohio: Wisc.)
F. disticha Hook. & Wils.—(La., Ala.)
F. Renauldi Card. = *F. Sullivantii* Aust. non Lindb.; *F. Lescurii*, var. *ramosior* Sull.?—(New Jersey.)

§ III. Lepidophyllæ.

- [*F. squamosa* L.]
 **F. Delamarei* R. & C.—(Miquelon.)
 **F. Dalecarlica* B. & S.—(Canada: Eastern States.)
F. Novæ-Angliæ Sull.—(Eastern States.)
 **F. Cardoti* Ren.—(Virginia.)
F. involuta R. & C. = *F. squamosa* Drumm. Musci-Am. II.n.152.—(La.)

§ IV. Malacophyllæ.

- F. hypnoides* Hartm.—(N. Am.)
 **F. nitida* Lindb. & Arn.—(Br. Columbia.)
 **F. tenella* Card.—(Idaho.)
F. Duriæi Sch.—(California.)
F. Lescurii Sull.—(excl. var.)—(Canada, U. S.)
F. flaccida R. & C.—(La.)
F. Sullivantii Lindb. = *F. Lescurii*, var. *gracilescens* Sull.—(U. S.)

§ V. Stenophyllæ.

- F. dichelymoides* Lindb.—(Minn.)

§ VI. Solenophyllæ.

- F. filiformis* S. & L.—(Ky.)
F. Langloisii Card.—(La.)
F. maritima Müll. and *F. mollis* Müll. (Washington) are both unknown to M. Cardot. North America has 24 species and subspecies out of the 52 known.

*Subspecies.